



SEQUENCE LISTING

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Zhong, Ziyang
Fang, Eric Y.
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Nguyen, Steve H.
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<120> GSK3 POLYPEPTIDES

<130> 59516-46/PP-15876.008

<140> US10/689,461

<141> 2002-07-31

<150> US09/916,109

<151> 2003-10-20

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<212> PRT

<213> Homo sapiens

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Gly	Ser	Phe	Gly	Val	Val	Tyr	Gln	Ala	Lys	Leu	Cys	Asp	Ser	Gly	Glu
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Leu	Val	Ala	Ile	Lys	Lys	Val	Leu	Gln	Asp	Lys	Arg	Phe	Lys	Asn	Arg
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Glu	Leu	Gln	Ile	Met	Arg	Lys	Leu	Asp	His	Cys	Asn	Ile	Val	Arg	Leu
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145					150					155					160
Tyr	Met	Tyr	Gln	Leu	Phe	Arg	Ser	Leu	Ala	Tyr	Ile	His	Ser	Phe	Gly
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Ile	Cys	His	Arg	Asp	Ile	Lys	Pro	Gln	Asn	Leu	Leu	Leu	Asp	Pro	Asp

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225					230					235				240	
Trp	Ser	Ala	Gly	Cys	Val	Leu	Ala	Glu	Leu	Leu	Gly	Gln	Pro	Ile	
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Phe	Pro	Gly	Asp	Ser	Gly	Val	Asp	Gln	Leu	Val	Glu	Ile	Ile	Lys	Val
		260					265					270			
Leu	Gly	Thr	Pro	Thr	Arg	Glu	Gln	Ile	Arg	Glu	Met	Asn	Pro	Asn	Tyr
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Thr	Glu	Phe	Lys	Phe	Pro	Gln	Ile	Lys	Ala	His	Pro	Trp	Thr	Lys	Val
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Phe	Arg	Pro	Arg	Thr	Pro	Pro	Glu	Ala	Ile	Ala	Leu	Cys	Ser	Arg	Leu
305					310					315					320
Leu	Glu	Tyr	Thr	Pro	Thr	Ala	Arg	Leu	Thr	Pro	Leu	Glu	Ala	Cys	Ala
			325					330					335		
His	Ser	Phe	Phe	Asp	Glu	Leu	Arg	Asp	Pro	Asn	Val	Lys	His	Pro	Asn
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Ser	Asn	Pro	Pro	Leu	Ala	Thr	Ile	Leu	Ile	Pro	Pro	His	Ala	Arg	Ile
	370				375					380					
Gln	Ala	Ala	Ala	Ser	Thr	Pro	Thr	Asn	Ala	Thr	Ala	Ala	Ser	Asp	Ala
385					390					395					400
Asn	Thr	Gly	Asp	Arg	Gly	Gln	Thr	Asn	Asn	Ala	Ala	Ser	Ala	Ser	Ala
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Phe	Gly	Ser	Met	Lys	Val	Ser	Arg	Asp	Lys	Asp	Gly	Ser	Lys	Val	Thr
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Thr	Val	Val	Ala	Thr	Pro	Gly	Gln	Gly	Pro	Asp	Arg	Pro	Gln	Glu	Val
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Ser	Tyr	Thr	Asp	Thr	Lys	Val	Ile	Gly	Asn	Gly	Ser	Phe	Gly	Val	Val
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Tyr	Gln	Ala	Lys	Leu	Cys	Asp	Ser	Gly	Glu	Leu	Val	Ala	Ile	Lys	Lys
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Lys	Leu	Asp	His	Cys	Asn	Ile	Val	Arg	Leu	Arg	Tyr	Phe	Phe	Tyr	Ser
	115					120					125				
Ser	Gly	Glu	Lys	Lys	Asp	Glu	Val	Tyr	Leu	Asn	Leu	Val	Leu	Asp	Tyr
	130					135				140					

Val	Pro	Glu	Thr	Val	Tyr	Arg	Val	Ala	Arg	His	Tyr	Ser	Arg	Ala	Lys
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Gln	Thr	Leu	Pro	Val	Ile	Tyr	Val	Lys	Leu	Tyr	Met	Tyr	Gln	Leu	Phe
				165					170						175
Arg	Ser	Leu	Ala	Tyr	Ile	His	Ser	Phe	Gly	Ile	Cys	His	Arg	Asp	Ile
			180					185					190		
Lys	Pro	Gln	Asn	Leu	Leu	Leu	Asp	Pro	Asp	Thr	Ala	Val	Leu	Lys	Leu
		195					200					205			
Cys	Asp	Phe	Gly	Ser	Ala	Lys	Gln	Leu	Val	Arg	Gly	Glu	Pro	Asn	Val
	210					215					220				
Ser	Tyr	Ile	Cys	Ser	Arg	Tyr	Tyr	Arg	Ala	Pro	Glu	Leu	Ile	Phe	Gly
225					230					235					240
Ala	Thr	Asp	Tyr	Thr	Ser	Ser	Ile	Asp	Val	Trp	Ser	Ala	Gly	Cys	Val
				245					250					255	
Leu	Ala	Glu	Leu	Leu	Leu	Gly	Gln	Pro	Ile	Phe	Pro	Gly	Asp	Ser	Gly
			260					265					270		
Val	Asp	Gln	Leu	Val	Glu	Ile	Ile	Lys	Val	Leu	Gly	Thr	Pro	Thr	Arg
		275					280					285			
Glu	Gln	Ile	Arg	Glu	Met	Asn	Pro	Asn	Tyr	Thr	Glu	Phe	Lys	Phe	Pro
	290					295					300				
Gln	Ile	Lys	Ala	His	Pro	Trp	Thr	Lys	Val	Phe	Arg	Pro	Arg	Thr	Pro
305					310					315					320
Pro	Glu	Ala	Ile	Ala	Leu	Cys	Ser	Arg	Leu	Leu	Glu	Tyr	Thr	Pro	Thr
				325					330					335	
Ala	Arg	Leu	Thr	Pro	Leu	Glu	Ala	Cys	Ala	His	Ser	Phe	Phe	Asp	Glu
			340					345					350		
Leu	Arg	Asp	Pro	Asn	Val	Lys	His	Pro	Asn	Gly	Arg	Asp	Thr	Pro	Ala
		355					360					365			
Leu	Phe	Asn	Phe	Thr	Thr	Gln	Glu	Leu	Ser	Ser	Asn	Pro	Pro	Leu	Ala
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<213> Homo sapiens

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Val	Val	Ala	Thr	Pro	Gly	Gln	Gly	Pro	Asp	Arg	Pro	Gln	Glu	Val	Ser
			20					25					30		
Tyr	Thr	Asp	Thr	Lys	Val	Ile	Gly	Asn	Gly	Ser	Phe	Gly	Val	Val	Tyr
		35					40					45			
Gln	Ala	Lys	Leu	Cys	Asp	Ser	Gly	Glu	Leu	Val	Ala	Ile	Lys	Lys	Val
	50					55					60				
Leu	Gln	Asp	Lys	Arg	Phe	Lys	Asn	Arg	Glu	Leu	Gln	Ile	Met	Arg	Lys
65					70					75					80
Leu	Asp	His	Cys	Asn	Ile	Val	Arg	Leu	Arg	Tyr	Phe	Phe	Tyr	Ser	Ser
				85					90					95	
Gly	Glu	Lys	Lys	Asp	Glu	Val	Tyr	Leu	Asn	Leu	Val	Leu	Asp	Tyr	Val
			100					105					110		
Pro	Glu	Thr	Val	Tyr	Arg	Val	Ala	Arg	His	Tyr	Ser	Arg	Ala	Lys	Gln
		115					120					125			
Thr	Leu	Pro	Val	Ile	Tyr	Val	Lys	Leu	Tyr	Met	Tyr	Gln	Leu	Phe	Arg

130		135		140											
Ser	Leu	Ala	Tyr	Ile	His	Ser	Phe	Gly	Ile	Cys	His	Arg	Asp	Ile	Lys
145					150					155					160
Pro	Gln	Asn	Leu	Leu	Leu	Asp	Pro	Asp	Thr	Ala	Val	Leu	Lys	Leu	Cys
				165					170					175	
Asp	Phe	Gly	Ser	Ala	Lys	Gln	Leu	Val	Arg	Gly	Glu	Pro	Asn	Val	Ser
			180					185					190		
Tyr	Ile	Cys	Ser	Arg	Tyr	Tyr	Arg	Ala	Pro	Glu	Leu	Ile	Phe	Gly	Ala
		195					200					205			
Thr	Asp	Tyr	Thr	Ser	Ser	Ile	Asp	Val	Trp	Ser	Ala	Gly	Cys	Val	Leu
	210					215					220				
Ala	Glu	Leu	Leu	Leu	Gly	Gln	Pro	Ile	Phe	Pro	Gly	Asp	Ser	Gly	Val
225				230					235					240	
Asp	Gln	Leu	Val	Glu	Ile	Ile	Lys	Val	Leu	Gly	Thr	Pro	Thr	Arg	Glu
			245					250					255		
Gln	Ile	Arg	Glu	Met	Asn	Pro	Asn	Tyr	Thr	Glu	Phe	Lys	Phe	Pro	Gln
			260					265					270		
Ile	Lys	Ala	His	Pro	Trp	Thr	Lys	Val	Phe	Arg	Pro	Arg	Thr	Pro	Pro
	275					280					285				
Glu	Ala	Ile	Ala	Leu	Cys	Ser	Arg	Leu	Leu	Glu	Tyr	Thr	Pro	Thr	Ala
290				295							300				
Arg	Leu	Thr	Pro	Leu	Glu	Ala	Cys	Ala	His	Ser	Phe	Phe	Asp	Glu	Leu
305				310					315					320	
Arg	Asp	Pro	Asn	Val	Lys	His	Pro	Asn	Gly	Arg	Asp	Thr	Pro	Ala	Leu
			325					330					335		
Phe	Asn	Phe	Thr	Thr	Gln	Glu	Leu	Ser	Asn	Pro	Pro	Leu	Ala	Thr	
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<213> Homo sapiens

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		20						25					30		
Gly	Gly	Gly	Pro	Gly	Gly	Ser	Ala	Ser	Gly	Pro	Gly	Gly	Thr	Gly	Gly
		35					40					45			
Gly	Lys	Ala	Ser	Val	Gly	Ala	Met	Gly	Gly	Gly	Val	Gly	Ala	Ser	Ser
	50					55					60				
Ser	Gly	Gly	Gly	Pro	Gly	Gly	Ser	Gly	Gly	Gly	Gly	Ser	Gly	Gly	Pro
65					70				75						80
Gly	Ala	Gly	Thr	Ser	Phe	Pro	Pro	Pro	Gly	Val	Lys	Leu	Gly	Arg	Asp
			85					90					95		
Ser	Gly	Lys	Val	Thr	Thr	Val	Val	Ala	Thr	Leu	Gly	Gln	Gly	Pro	Glu
			100					105					110		
Arg	Ser	Gln	Glu	Val	Ala	Tyr	Thr	Asp	Ile	Lys	Val	Ile	Gly	Asn	Gly
		115					120					125			
Ser	Phe	Gly	Val	Val	Tyr	Gln	Ala	Arg	Leu	Ala	Glu	Thr	Arg	Glu	Leu
	130					135					140				
Val	Ala	Ile	Lys	Lys	Val	Leu	Gln	Asp	Lys	Arg	Phe	Lys	Asn	Arg	Glu
145					150					155					160

Leu	Gln	Ile	Met	Arg	Lys	Leu	Asp	His	Cys	Asn	Ile	Val	Arg	Leu	Arg
				165					170					175	
Tyr	Phe	Phe	Tyr	Ser	Ser	Gly	Glu	Lys	Lys	Asp	Glu	Leu	Tyr	Leu	Asn
			180					185					190		
Leu	Val	Leu	Glu	Tyr	Val	Pro	Glu	Thr	Val	Tyr	Arg	Val	Ala	Arg	His
		195					200					205			
Phe	Thr	Lys	Ala	Lys	Leu	Thr	Ile	Pro	Ile	Leu	Tyr	Val	Lys	Val	Tyr
	210					215					220				
Met	Tyr	Gln	Leu	Phe	Arg	Ser	Leu	Ala	Tyr	Ile	His	Ser	Gln	Gly	Val
225					230					235					240
Cys	His	Arg	Asp	Ile	Lys	Pro	Gln	Asn	Leu	Leu	Val	Asp	Pro	Asp	Thr
			245					250						255	
Ala	Val	Leu	Lys	Leu	Cys	Asp	Phe	Gly	Ser	Ala	Lys	Gln	Leu	Val	Arg
			260					265					270		
Gly	Glu	Pro	Asn	Val	Ser	Tyr	Ile	Cys	Ser	Arg	Tyr	Tyr	Arg	Ala	Pro
		275					280					285			
Glu	Leu	Ile	Phe	Gly	Ala	Thr	Asp	Tyr	Thr	Ser	Ser	Ile	Asp	Val	Trp
	290					295					300				
Ser	Ala	Gly	Cys	Val	Leu	Ala	Glu	Leu	Leu	Leu	Gly	Gln	Pro	Ile	Phe
305				310						315					320
Pro	Gly	Asp	Ser	Gly	Val	Asp	Gln	Leu	Val	Glu	Ile	Ile	Lys	Val	Leu
				325				330						335	
Gly	Thr	Pro	Thr	Arg	Glu	Gln	Ile	Arg	Glu	Met	Asn	Pro	Asn	Tyr	Thr
			340					345					350		
Glu	Phe	Lys	Phe	Pro	Gln	Ile	Lys	Ala	His	Pro	Trp	Thr	Lys	Val	Phe
	355					360						365			
Lys	Ser	Arg	Thr	Pro	Pro	Glu	Ala	Ile	Ala	Leu	Cys	Ser	Ser	Leu	Leu
	370					375					380				
Glu	Tyr	Thr	Pro	Ser	Ser	Arg	Leu	Ser	Pro	Leu	Glu	Ala	Cys	Ala	His
385				390						395					400
Ser	Phe	Phe	Asp	Glu	Leu	Arg	Cys	Leu	Gly	Thr	Gln	Leu	Pro	Asn	Asn
			405					410						415	
Arg	Pro	Leu	Pro	Pro	Leu	Phe	Asn	Phe	Ser	Ala	Gly	Glu	Leu	Ser	Ile
			420				425						430		
Gln	Pro	Ser	Leu	Asn	Ala	Ile	Leu	Ile	Pro	Pro	His	Leu	Arg	Ser	Pro
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Ala	Gly	Thr	Thr	Thr	Leu	Thr	Pro	Ser	Ser	Gln	Ala	Leu	Thr	Glu	Thr
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Asn	Ser	Ser													

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<212> PRT

<213> Homo sapiens

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Gly	Gly	Gly	Pro	Gly	Gly	Ser	Ala	Ser	Gly	Pro	Gly	Gly	Thr	Gly	Gly
		35				40					45				
Gly	Lys	Ala	Ser	Val	Gly	Ala	Met	Gly	Gly	Gly	Val	Gly	Ala	Ser	Ser

50						55						60			
Ser	Gly	Gly	Gly	Pro	Gly	Gly	Ser	Gly	Gly	Gly	Gly	Ser	Gly	Gly	Pro
65					70					75					80
Gly	Ala	Gly	Thr	Ser	Phe	Pro	Pro	Pro	Gly	Val	Lys	Leu	Gly	Arg	Asp
				85					90					95	
Ser	Gly	Lys	Val	Thr	Thr	Val	Val	Ala	Thr	Leu	Gly	Gln	Gly	Pro	Glu
			100					105					110		
Arg	Ser	Gln	Glu	Val	Ala	Tyr	Thr	Asp	Ile	Lys	Val	Ile	Gly	Asn	Gly
		115					120					125			
Ser	Phe	Gly	Val	Val	Tyr	Gln	Ala	Arg	Leu	Ala	Glu	Thr	Arg	Glu	Leu
	130					135					140				
Val	Ala	Ile	Lys	Lys	Val	Leu	Gln	Asp	Lys	Arg	Phe	Lys	Asn	Arg	Glu
145					150					155					160
Leu	Gln	Ile	Met	Arg	Lys	Leu	Asp	His	Cys	Asn	Ile	Val	Arg	Leu	Arg
				165					170					175	
Tyr	Phe	Phe	Tyr	Ser	Ser	Gly	Glu	Lys	Lys	Asp	Glu	Leu	Tyr	Leu	Asn
			180					185						190	
Leu	Val	Leu	Glu	Tyr	Val	Pro	Glu	Thr	Val	Tyr	Arg	Val	Ala	Arg	His
		195					200					205			
Phe	Thr	Lys	Ala	Lys	Leu	Thr	Ile	Pro	Ile	Leu	Tyr	Val	Lys	Val	Tyr
	210					215					220				
Met	Tyr	Gln	Leu	Phe	Arg	Ser	Leu	Ala	Tyr	Ile	His	Ser	Gln	Gly	Val
225					230					235					240
Cys	His	Arg	Asp	Ile	Lys	Pro	Gln	Asn	Leu	Leu	Val	Asp	Pro	Asp	Thr
				245					250					255	
Ala	Val	Leu	Lys	Leu	Cys	Asp	Phe	Gly	Ser	Ala	Lys	Gln	Leu	Val	Arg
			260					265					270		
Gly	Glu	Pro	Asn	Val	Ser	Tyr	Ile	Cys	Ser	Arg	Tyr	Tyr	Arg	Ala	Pro
		275					280					285			
Glu	Leu	Ile	Phe	Gly	Ala	Thr	Asp	Tyr	Thr	Ser	Ser	Ile	Asp	Val	Trp
	290					295					300				
Ser	Ala	Gly	Cys	Val	Leu	Ala	Glu	Leu	Leu	Leu	Gly	Gln	Pro	Ile	Phe
305					310					315					320
Pro	Gly	Asp	Ser	Gly	Val	Asp	Gln	Leu	Val	Glu	Ile	Ile	Lys	Val	Leu
				325					330					335	
Gly	Thr	Pro	Thr	Arg	Glu	Gln	Ile	Arg	Glu	Met	Asn	Pro	Asn	Tyr	Thr
			340					345					350		
Glu	Phe	Lys	Phe	Pro	Gln	Ile	Lys	Ala	His	Pro	Trp	Thr	Lys	Val	Phe
		355					360					365			
Lys	Ser	Arg	Thr	Pro	Pro	Glu	Ala	Ile	Ala	Leu	Cys	Ser	Ser	Leu	Leu
	370					375					380				
Glu	Tyr	Thr	Pro	Ser	Ser	Arg	Leu	Ser	Pro	Leu	Glu	Ala	Cys	Ala	His
385					390					395					400
Ser	Phe	Phe	Asp	Glu	Leu	Arg	Cys	Leu	Gly	Thr	Gln	Leu	Pro	Asn	Asn
				405					410					415	
Arg	Pro	Leu	Pro	Pro	Leu	Phe	Asn	Phe	Ser	Ala	Gly	Glu	Leu	Ser	Ile
			420					425					430		
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 <213> Homo sapiens

<400> 6


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 35      40      45
Val Ala Ile Lys Lys Val Leu Gln Asp Lys Arg Phe Lys Asn Arg Glu
 50      55      60
Leu Gln Ile Met Arg Lys Leu Asp His Cys Asn Ile Val Arg Leu Arg
 65      70      75      80
Tyr Phe Phe Tyr Ser Ser Gly Glu Lys Lys Asp Glu Leu Tyr Leu Asn
 85      90      95
Leu Val Leu Glu Tyr Val Pro Glu Thr Val Tyr Arg Val Ala Arg His
 100     105     110
Phe Thr Lys Ala Lys Leu Thr Ile Pro Ile Leu Tyr Val Lys Val Tyr
 115     120     125
Met Tyr Gln Leu Phe Arg Ser Leu Ala Tyr Ile His Ser Gln Gly Val
 130     135     140
Cys His Arg Asp Ile Lys Pro Gln Asn Leu Leu Val Asp Pro Asp Thr
 145     150     155     160
Ala Val Leu Lys Leu Cys Asp Phe Gly Ser Ala Lys Gln Leu Val Arg
 165     170     175
Gly Glu Pro Asn Val Ser Tyr Ile Cys Ser Arg Tyr Tyr Arg Ala Pro
 180     185     190
Glu Leu Ile Phe Gly Ala Thr Asp Tyr Thr Ser Ser Ile Asp Val Trp
 195     200     205
Ser Ala Gly Cys Val Leu Ala Glu Leu Leu Leu Gly Gln Pro Ile Phe
 210     215     220
Pro Gly Asp Ser Gly Val Asp Gln Leu Val Glu Ile Ile Lys Val Leu
 225     230     235     240
Gly Thr Pro Thr Arg Glu Gln Ile Arg Glu Met Asn Pro Asn Tyr Thr
 245     250     255
Glu Phe Lys Phe Pro Gln Ile Lys Ala His Pro Trp Thr Lys Val Phe
 260     265     270
Lys Ser Arg Thr Pro Pro Glu Ala Ile Ala Leu Cys Ser Ser Leu Leu
 275     280     285
Glu Tyr Thr Pro Ser Ser Arg Leu Ser Pro Leu Glu Ala Cys Ala His
 290     295     300
Ser Phe Phe Asp Glu Leu Arg Cys Leu Gly Thr Gln Leu Pro Asn Asn
 305     310     315     320
Arg Pro Leu Pro Pro Leu Phe Asn Phe Ser Ala Gly Glu Leu Ser Ile
 325     330     335
Gln Pro Ser Leu Asn Ala Ile Leu Ile Pro Pro His Leu Arg Ser
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<213> Artificial Sequence

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<220>
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10

15

<210> 9

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<212> PRT

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<210> 10

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<223> elution peptide

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Glu Tyr Met Pro Thr Asp

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5

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<223> Peptide substrate phosphorylatable by GSK3

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<223> Xaa = Any Amino Acid

<400> 11

Ser Xaa Xaa Xaa Ser

1

5